CASE REPORT

Congenital Diaphragmatic Eventration In A Nigerian Child

M. A. Salami MBBS, **O. A. Adebo** FRCSC, FWACS.

Department of Surgery, University College Hospital and University of Ibadan, Nigeria

ABSTRACT

***Background**: Diaphragmatic eventration is a rare cause of respiratory distress and failure to thrive in children.*

***Method/Result**: A report of a case of diaphragmatic eventration in a four-month-old child is presented with a review of the relevant literature.*

***Conclusion**: Clinicians should be aware of this diagnosis and avoid misdiagnosing the condition as a diaphragmatic hernia.*

KEYWORD: *Diaphragmatic eventration; congenital*

Paper accepted for publication 25th June 2005.

INTRODUCTION

Diaphragmatic eventration is the abnormal elevation of the diaphragm as a result of aplasia, paralysis or atrophy of the muscle fibers. It could be congenital or acquired. Congenital eventration of the diaphragm is due to phrenic nerve involvement by many processes: mitotic and inflammatory diseases or trauma during delivery or operation[1].

We report a case of diaphragmatic eventration in a 4-month old child.

CASE REPORT

A four-month-old boy was referred to our hospital in March 2003, with a diagnosis of diaphragmatic hernia. He presented with difficulty in breathing from birth, and this had worsened in the three weeks before presentation. There was associated cough and fever. Pregnancy and birth history were uneventful and there was no history of previous thoracic procedure or trauma.

Examination revealed a small-for-age (weight = 4.4kg = 70% of expected) child with extensive blebs on the neck and upper chest. He was dyspnoeic with a respiratory rate of 80/min, markedly reduced breath sounds in the right lower and middle zones and bilateral widespread crepitations. The pulse rate was 160/min with normal first and second heart sounds.

Chest radiograph (Fig. 1a & b) showed a smooth convex elevation of the right hemidiaphragm with a homogenous opacity beneath it. There was right lung collapse and also multiple bilateral pulmonary opacities. Chest ultrasonography showed intact non-moving elevated right hemidiaphragm below which the liver was seen within the right hemithorax. A diagnosis of right hemidiaphragmatic eventration and bronchopneumonia was made.

The child was placed on intravenous antibiotics (cefuroxime) and topical clotrimazole. The child improved on this management except for persistent tachypnoea (50-60/min). He was then worked up for surgery and had a right thoracotomy and plication of the right hemidiaphragm. He made satisfactory progress following surgery with weight gain and normal respiratory rate at the time of discharge (Fig. 2). He was reviewed two months after discharge and found to be improved clinically.

DISCUSSION

Petit[2], in 1774, recognised eventration of the diaphragm as a pathological entity during a postmortem examination. It could be unilateral or bilateral (with associated more dramatic presentation and management challenges)[3,4].

The condition could be confused with diaphragmatic hernia as reflected in the referral letter of the index patient to our hospital. Such error is due to failure to appreciate that in congenital diaphragmatic hernia there is a complete absence of a portion of the diaphragm such that the abdominal viscera herniates into the thorax and lie free within the pleural cavity.

This is the second reported case from Nigeria; the first case was diagnosed at postmortem[4]. The diagnosis was missed because of accompanying peritoneal reaction, which was misdiagnosed as an effusion[4]. Diaphragmatic eventration is a rare clinical entity[5]. The motion of the elevated diaphragm may be normal, diminished, paradoxical or absent[6]. The abnormally elevated diaphragm may compress the ipsilateral lung, and with respiratory effort the mediastinum may shift towards the normal side.

Symptomatic eventration is most frequently found in infants and may cause life-threatening respiratory distress. Infants are greatly dependent on the diaphragm and abdominal musculature for normal ventilation because the accessory muscles of inspiration are weak. Moreover, the mobile mediastinum interferes with the action of the contralateral hemidiaphragm.

Features associated with delayed diagnosis include stunting of growth, nausea, heartburn, postprandial vomiting, constipation and epigastric discomfort[7]. These can be explained by the increased energy expenditure required for

Correspondence to: **Dr. M.A. Salami**

respiratory efforts in these infants.

Any newborn or young infant with respiratory distress should have a roentgenogram of the chest. The radiological finding in our patient is classic.

Fluoroscopy can further confirm the absence of synchronous motion of the two halves of the diaphragm, with the involved side, either remaining stationary or actually rising during an inspiratory effort. Ultrasonography of the chest can establish the distinction from diaphragmatic hernia as an intact, but thin elevated diaphragm is seen. Other available investigatory modalities include phrenic nerve conduction studies[8], laparoscopy and video-assisted thoracoscopy.

The surgical repair of eventration consists of transthoracic plication of the redundant diaphragm so as to lower it to a position of mid-expiration. There is little difficulty at thoracotomy in distinguishing congenital eventration with its membranous appearance from the acquired type, in which the diaphragm, even if somewhat atrophic, is still fully muscular. Our patient had congenital diaphragmatic eventration.

Currently, thoracotomy can be avoided with several authors now reporting successful plication via video assisted thoracoscopy[9].

Outcome of treatment is usually successful and diaphragmatic plication has proved to be a safe, well-tolerated and effective procedure for symptomatic diaphragmatic eventration[10]. Difficulty with weaning from ventilator, prematurity and associated anomalies are poor prognostic indicators.

Congenital diaphragmatic eventration should be considered as a possible cause of respiratory distress, and failure to thrive in an infant. Treatment by plication of the diaphragm is curative and successful.

REFERENCES

1. De Bord RA, Giunta EJ. Congenital eventration of the diaphragm. J Thorac Surg 1956; 31:731-6.
2. Petit JL. Traite des malades chirugicales et des operations qui leur conviennent: ouvrage post hume de JL Petit. (Revised edition) Edited by P. Lerne. Paris: Mequignon, 1790; Vol 11:233.
3. Elberg JJ, Brok KE, Pedersen SA, Kock KE. Congenital bilateral eventration of the diaphragm in a pair of male twins J Pediatr Surg 1989; 24 (11): 1140-1.
4. Falade AG. Right diaphragmatic eventration simulating neonatal pleural effusion: a case report. Annals of Tropical Paediatrics 1992; 12: 221-3.
5. Beck WC, Motsan DS. Eventration of Diaghragm. Arch Surg 1952; 65:557.
6. Symbas PN, Hatcher CR Jr, Waldo W. Diaphragmatic eventration in infancy and childhood. Annals of Thoracic Surgery 1977; 24:113-9.
7. Oh A, Gulati G, Sherman ML, Golub R, Kutin N. Bilateral Eventration of the Diaphragm with Perforated Gastric Volvulus in an Adolescent. J Pediatr Surg 2000; 35:1824-6.
8. Moosa AE. Phrenic nerve conduction in children. Develop Med Child Neurol 1981; 23:434-48.
9. Monroux J, Padovani B, Poirier NC, *et al.* Technique for the repair of diaphragmatic eventration. Ann Thoracic Surg 1996; 62 (3): 905-7.
10. Kizilean F, Tanyel FC, Hisconmex A, Buyukpamukcu N. The long-term results of diaphragmatic plication. J Pediatr Surg 1993; 28 (1): 42-4.

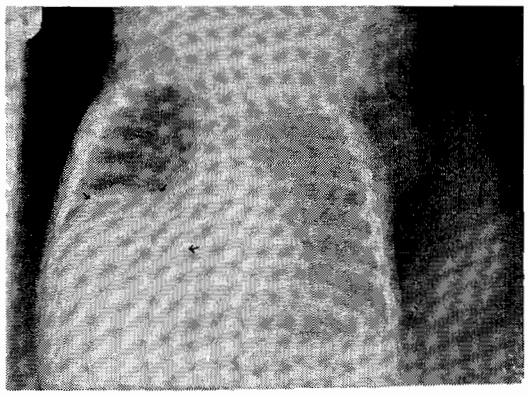

Fig 1a

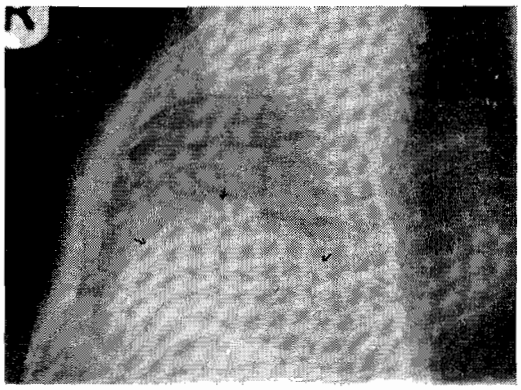

Fig 1b

Figure. 1a. and 1b. Chest X-ray PA and Lateral. Elevation of the right diaphragm is apparent on both views (black arrows).

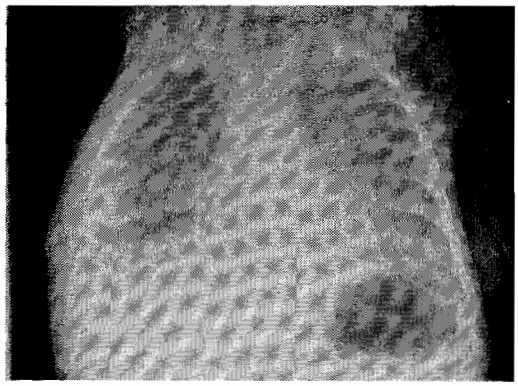

Fig 2.

Figure. 2. Chest X-ray PA. Restoration of right diaphragm to normal position; post-op pleural reaction.